

and re-condensed by the cold air of the snow-clad summits. The great amount of rain in the border-ridges is the more striking as in East Turkestan rain is exceedingly scarce, and there is but very little rain at a level below 6000 feet. Prjevalsky concludes that the heavy summer rains which fall in the Keriya Mountains every year are due to the south-western winds coming from the Indian Ocean, and he maintains that the effects of the monsoon winds are felt even in the upper parts of the Hoang-ho.

From Khotan the Expedition went northwards, across the desert. It crossed the Tarim at the confluence of the Yarkand-daria and the Aksu-daria, at a height of 3100 feet above the sea. The river has there a width of 185 yards, and an average depth of from 3 to 4 feet at low water. The velocity of the current was 160 feet in a minute. From these facts, as well as from what he saw of the Lower Tarim, Prjevalsky concludes that the river can be navigated by small steamers from Lob-nor up to the confluence of the Yarkand and Aksu Rivers, and that the two latter can also be navigated to some extent.

The last chapter of the work is devoted to a general sketch of the political condition of Central Asia; but those who are acquainted with the recent literature of the subject will find little new in it. Geographers who may propose to explore Central Asia will find more to interest them in the introductory chapter devoted to the ways and means of travelling in Central Asia, with minute instructions as to how to organize expeditions. This chapter is full of practical hints. As to the scientific problems, Prjevalsky remarks that the present period of great discoveries in Central Asia is rapidly coming to an end. Few parts of what was formerly the great *terra incognita* remain to be explored; so that we approach a time when regular scientific expeditions will be necessary. There remain for investigation by means of "scientific reconnaissances" the plateaus of Northern Tibet, the highlands of Eastern Tibet and Amdo, and Southern Tibet from Lhasa to Gartok. Three expeditions, lasting two or three years each, would suffice for the exploration of these three regions. The Pamir, with the Hindu-Kush and the Karakorum Mountains, the Eastern Tian-shan, the Altyn-tagh and the Nian-shan, the border-ridges of South-East Mongolia, the whole of the great Khingan, and North-Western Mongolia, close to the Siberian frontier, come next. Dealing with the subject of special scientific explorations, he recommends the Karashar and Si-nin for zoologists; the Tchertchen oasis for archaeologists; Si-nin for ethnographers; Kashgar and Khotan, and Si-nin and Urga, for meteorologists; and the whole of Central Asia for geologists.

The present volume has three maps. One of them, on the scale of 67 miles to the inch, embodies the results of the four journeys of Prjevalsky, and is an excellent map of the eastern parts of Central Asia. Two maps, on the scale of 33 miles to the inch, embody the original surveys of the Expedition at the sources of the Yellow River and in East Turkestan. Numbers of excellent photo-lithographs, and three drawings representing new species of *Antelope* and *Ovis*, are inserted in the work.

Many years will elapse before the complete descriptions of Prjevalsky's rich collections will be published. All that can now be said is that they are in excellent hands.

K. I. Maximowicz, A. A. Strauch, S. M. Hertenstein E. A. Büchner, A. S. Woeikoff, and A. A. Inostrantseff are busily occupied with them, and the first parts of their common work are already in print. The first instalment of the first volume, containing the "Mammals," by E. Büchner, was issued at St. Petersburg a few days ago.

P. K.

FLOWERING PLANTS OF WILTSH.

Flowering Plants of Wilts; with Sketches of the Physical Geography and Climate of the County. By the Rev. T. A. Preston, M.A. 500 pp. With a Map. (Published by the Wiltshire Archaeological and Natural History Society, 1888.).

IN Wiltshire, the chalk downs which form so characteristic a feature of the geology and physical geography of the South of England reach their western limits. The area of the county is about 1300 square miles. It does not anywhere reach the coast, and forms a watershed from which small streams run in three directions, to the Severn, Thames, and English Channel. An elevated plateau of chalk on the south-east occupies more than half the area of the county. This is divided into two unequal halves by a natural depression, called the Vale of Pewsey, which runs almost due east and west, from Devizes to Hungerford. Along this hollow runs the Kennet and Avon Canal, of which the highest point, near Savernake, reaches an altitude of 500 feet. The northern portion of this chalk plateau is called Marlborough Downs, and the town of Marlborough stands nearly in the centre of it. The southern part is Salisbury Plain, the word plain as here applied conveying a delusive notion. Salisbury is at the south, and Stonehenge near the centre of this southern chalk tract. The highest points of these chalk downs reach a height of from 800 to 950 feet. The third section of the county, lying west and north of the chalk, is the fertile plain, underlain by greensand and oolite, along which the Great Western Railway runs between Swindon and Bath. The following extract from the introductory essay contributed to this flora by the Rev. J. Sowerby gives, in a few words, an excellent idea of the general characteristics of these different districts:--

"The great characteristic of the chalk plateau is its vast extent of grass-land, where sheep are extensively pastured. This space is more broken up each year for cultivation, but often exhibits great tracts of grass, with only occasional patches of furze. Only on the small patches of Tertiary scattered here and there, especially in the northern part, do we find wood (generally only underwood), excepting the grand forest of Savernake, twenty square miles in area, which can show timber of an age and size unrivalled in any part of England. The upper chalk hills were once, it is probable, covered with extensive copses, chiefly thorns. Remains of these still occur here and there; and individual trees of great size, some yet extant, others only traditional or historical, attest the former existence of a primeval wood. In the hollows of the downs, especially near the villages, there are spaces, often finely timbered, especially with elms. Monotonous as the surface of the downs may seem to be, the changes that present themselves are often singularly picturesque and varied. After passing, it may be for hours, over the gently sloping grass plains, all blue above, all green below, the traveller suddenly sees below him a

village embosomed in woods, with its picturesque church tower, surrounded by fertile and well-tilled land. Such an experience is obtained by the traveller who passes over the downs from Marlborough to Avebury or Wootton Bassett, from Heytesbury to Chittern or Imber, from Warminster over Battlesbury, and the projecting spur of Bratton Castle to Steeple and Prood Ashton, on their picturesque hills.

"The part of the county lying north and west of the chalk plateau is of a different character. It is the plain country, as the other is the hill country of Wiltshire. They have been called 'the cheese' and 'the chalk.' This part includes, in the north, the country drained by the Thames and its affluent the Cole, and on the west that drained by the Bristol Avon. It consists of various geological strata, but chiefly of Oxford clay, a band of which, with an average breadth of nearly five miles, traverses this part of the county from north-east to south-west. Viewed from the outer edge of the chalk escarpment, this region presents the appearance of a vast, well-wooded, and fertile plain, bounded in the far distance by the hill-ranges of the adjoining counties of Gloucester and Somerset. The outer slope of the chalk plateau descends a hundred feet or so, its steep sides covered with turf or clothed with hanging wood, and then slopes gently down to the level. Here is a land of pasture-fields and hedges, overshadowed everywhere by elms, growing mostly in the stiff clay soil that overlies the Kimmeridge clay and Coral Rag. Beyond the level, in front, rises a line of hills of the Coral Rag formation. These hills again descend, with an abrupt slope, into the valley (or plain) through which the Avon flows. The most picturesque scenery is found on the outer slopes of the hills. The plain, though often finely wooded, is somewhat tame, though its gentle hills and dales are not wanting in a beauty of their own."

What is said in the introductory chapter about the climate of the county is not satisfactory. Mr. Sowerby sums it up as follows:—

"On the whole, Wiltshire has probably the most elevated surface of any English county. This gives it certain peculiarities of climate. Its average mean summer temperature is higher, its mean winter temperature lower, than those of any other English county."

In the Report issued by the Royal Horticultural Society, edited by the Rev. George Henslow, on the effect on garden plants of the severe winters of 1879-80 and 1880-81, full details are given for the county of the plants that were injured and uninjured. Taking what is there stated in connection with the full details about the native vegetation of the county which are given in the body of the present work, it is quite clear that the whole of the county belongs to the warmest of Watson's six climatic zones, the Inferagrarian, of which *Clematis Vitalba*, *Viburnum Lantana*, and *Ruscus aculeatus*, are three out of many characteristic plants. The Inferagrarian and Midagrarian zones are represented in England at sea-level; and two others, the Superagrarian and Inferarctic, in the hill-country of the North of England; the two coldest of the six, the Midarctic and Superarctic, being reached only amongst the higher mountains of the Scotch Highlands. So far as one can judge from the botanical point of view, Kent, Sussex, Surrey, Hampshire, and Wilts stand substantially on the same level as regards climate, and cover the whole extent of Watson's Inferagrarian zone, without reaching into the Midagrarian. Mr. Preston is an experienced climatologist and phenologist, and no doubt is quite aware that such is the case;

but nowhere in the present work can we find a clear explanation of the true state of the case, which from the point of view of botanical geography is all-important.

Besides the introductory sketch of the physical geography of the county by Mr. Sowerby, and the chapter on its temperature and rainfall, there is one on its geology, with a table of the twenty strata represented in the county twelve of which belong to the Oolitic series, four to the Cretaceous, and four to the Tertiary. Mr. G. S. Boulger contributes a sketch of its drainage, on which Mr. Preston founds eleven districts, under which he classifies the localities of the rarer plants. Two of these drain into the Severn, two into the Thames, and the other seven into the English Channel. Out of the 500 pages, 430 are occupied with a catalogue of the flowering plants of the county, with such detailed localities for the rarities as have been noted. Great pains seems to have been taken to identify the species, and to trace out their dispersion through the different districts. The eighth edition of the "London Catalogue" is followed as a standard of nomenclature; and out of the 1760 species there registered for the whole of Britain, 849 have been found in Wiltshire. Of these about 50 are marked as introduced, and at least 50 more are reckoned as varieties in Watson's "Cybele," where the number of wild British plants, including ferns, is estimated at 1425. Of these 1425 species, 530 are spread over the whole of Britain, 600 scarcely reach into Scotland, 200 are characteristically boreal types, and 77 too local to be classified. Wiltshire yields two plants which are not known elsewhere in Britain—*Cnicus tuberosus* and *Carex tomentosa*—both widely spread on the Continent. Out of 600 austral types, 127 are characteristically eastern in England. These are mostly plants that prefer chalk and limestone, and are well represented in the county. Add 30 for ferns, and 780 species for Wiltshire will be about the number on Watson's scale of reckoning, and compares properly with the figures as given in tables on pp. 371-81, and elsewhere in the fourth volume of the "Cybele." This is a smaller number than the plants of Kent, Surrey, and Hants, and about on a par with Dorsetshire and Hertfordshire. In all these counties the boreal element of the British flora is substantially eliminated. The special deficiency or unusual rarity in Wilts is of the plants of sandy heatherland, such as the foxglove, *Ulex europæus*, the fruticose Rubi, and many of the Trifolia, and such grasses as *Aira præcox*, *Deschampsia flexuosa*, and *Nardus stricta*. Altogether the book is one which no one who is interested in the distribution of British plants can afford to neglect.

J. G. BAKER.

MR. DODGSON ON PARALLELS.

Curiosa Mathematica. Part I. A New Theory of Parallels. By Charles L. Dodgson, M.A. (London: Macmillan and Co., 1888.)

THIS small book came into the world a little too soon or a little too late for our comfort. It was offered to us for notice in mid-vacation, and thinking we should find something amusing, we incontinently accepted the offer. We found some amusement, for, contrary to the author's experience, we read the preface, which is rather drawn out, but here and there is brightened by a quaint